

## STANDARD ADULT POPULATION SAMPLING

Proper assessment of each of North Dakota's 200 plus fisheries is paramount to sound management. Adult population sampling is a key method in assessing these fisheries. As such, the information gathered from adult population sampling must be reliable and comparable. For these reasons a standardized approach toward field surveys is required.

### **Standardization of gear, location and time of sampling**

Adult fish will be sampled with experimental mesh gill nets, frame nets, and electrofishing gear. Gill nets are to be fished on the bottom perpendicular to shore in depths of 8' to 30' (recommend small mesh panels shallow - large mesh panels deep). In some lakes with steep sloping banks it may be necessary to set gill nets parallel to the shore. The net should not be set in oxygen deficient water. In most cases a standard set will be overnight and will total approximately 20 hours. If select species are extremely abundant the hours of netting may be reduced.

Frame nets are to be fished perpendicular to shore. The top of the frames should be set  $\frac{1}{2}$  to 1 foot under the water surface. As with gill nets, frame nets will be set overnight. Standard net components per are as follows:

- Lakes less than 1200 acres and reservoirs less than 500 acres: 1 - 125' var, 1 - 3' x 4' frame net ( $\frac{1}{4}$ " ), 1 - 4' x 6' frame net ( $\frac{1}{2}$ " ).
- Lakes between 1200-2400 acres and reservoirs between 500-5400 acres: 3 - 125' var, 1 - 300' lg. mesh var, 3 - 4' x 6' frame net ( $\frac{1}{2}$ " ).
- Large reservoirs over 9000 acres (Sakakawea, Oahe, Audubon, Darling): 3 - 250' var, 1 - 300' lg. mesh var.
- Nets for Devils Lake are currently being evaluated.

Because the amount of effort required to obtain statistically significant results may be impractical, the overall sampling design will instead focus upon standardizing effort between equivalent size (surface acres) water bodies. Table 1 categorizes the respective water bodies by size and includes a number of sets for each category. The number of lakes sampled annually will depend upon district priorities. However, at

minimum, when surveys are conducted on a given water body, the amount of effort shown in Table 1 must be used.

In addition to standardizing nets and sets, the location and time of sampling should also be standardized. Permanent sampling locations for each net type should be established on each lake, then marked, and described on a suitable lake map. This map should be made a permanent part of the lake's file. Under certain conditions such as drought, sampling the exact same station may not be possible, but the same general area or similar area should be sampled. Depending upon the area in the state, the time in which adult population sampling is conducted for each respective lake should be standardized between late May through July (Table 1). Special circumstances such as access, heavy vegetative growth, or a historical database (i.e., Spiritwood Lake) may warrant establishing a standard sampling time during some other time period.

The intent for standardizing locations and time of sampling is to monitor the fishery and observe relative changes over time (valid annual comparisons). Failure to follow a sampling design results in data that only describes the situation at one instant in time (Johnson and Nielson 1983). Permanent sampling stations reduce variance and can yield index type information.

Electrofishing will be used occasionally to supplement the net catch and to sample species normally not captured in gill or frame nets. Because techniques are relatively new in North Dakota a standardized procedure to sampling may be modified in future years. However, for the present time the following procedure will be used.

Choose a location on the lake from which to begin electrofishing at sundown. Electrofish in a predetermined direction for one hour or until the entire shoreline is sampled (whichever is first). Areas of select habitat may be chosen. In the rare event that electrofishing by time proves impractical on a given lake, use distance but be sure to record the time it takes for shocking the distance. This will enable you to convert back to fish per unit of effort. Two people will be on the bow of the boat to collect (dip) game fish.

To keep the effort standard from year to year, stations should be described on the lake map along with specifications for electrofishing settings, and other pertinent data. Sampling will be done at a time of year when the target species is vulnerable and variability in catch is expected to be low. Preferably it can be done in conjunction with adult population netting.

### **Data Collection**

Enter required data in the header of the CATCH RECORD FIELD DATA FORMS. Catches from each net must be kept separate until the respective species are

enumerated. Once completed, the separate net (same gear type) catches can be combined before obtaining length-weight information. Lengths and weights for smaller forage fish (e.g. fathead minnows) will not be collected. If practical, total lengths for all other fish will be recorded to 10 mm increments; otherwise length data in 25 mm increments will be collected. One weight (gm) per length grouping must be recorded for rough and/or larger forage fish whereas game and pan fish must have three separate weights per length increment.

When field work is complete, all data sheets should be reviewed immediately for completeness and possible errors. The importance of thoroughly filling out the data sheets cannot be over-emphasized. Data should be entered onto the catch record program (AC1) at the respective district offices as soon as possible and again errors in the data or data entry must be corrected immediately.

### **End-Products**

Results from ADULT POPULATION SAMPLING will include detailing species composition, population status and population trends. In addition, average and median lengths and weights, condition factors, relative weights, and population structural indices will also be derived for select species in order to document the health of both individuals and the species population. Supplemental age-growth and food habits are optional but can also provide useful data. This information in combination with other sampling (e.g. reproductive sampling) will provide the mechanism for making management and research decisions.

## FALL REPRODUCTION SAMPLING

Proper assessment of each of North Dakota's 200 plus fisheries is paramount to sound management. Adult population sampling is a key method in assessing these fisheries especially as it relates to determining the status of a catchable population for the fishing public. However, this assessment cannot be made until 2-5 years after the year class has become established. For this reason, data procured during **fall reproduction sampling** is fundamental in providing biologists with future predictive capabilities regarding the respective fisheries. For example, walleye young-of-year (YOY) catch rates for Lake Sakakawea are strongly correlated with future adult population strength (Figure 1). With this information, stocking and/or regulation adjustments can be made in an effort to optimize the sport fishery.

It is imperative the information gathered from fall reproduction sampling must be reliable and comparable. For these reasons a standardized approach toward field surveys is required.

### **Standardization of gear, effort, location and time of sampling**

YOY fish will be sampled with 1/2" and variegated small mesh gill nets, frame nets, and electrofishing gear. Standard net components however, will be 1/2" mesh gill nets (6' x 125') and small frame nets (3' x 4', 1/4" mesh). Gill nets are to be fished on the bottom perpendicular to shore in depths of 8' to 30'. In some lakes with steep sloping banks it may be necessary to set gill nets parallel to the shore. The net must not be set in oxygen deficient water and thus fall sampling after 'turnover' is recommended. In most cases a standard set will be overnight and will total approximately 20 hours. If select species are extremely abundant the hours of netting may be reduced.

Frame nets are to be fished perpendicular to shore. The top of the frames should be set 1/2 to 1 foot under the water surface. As with gill nets, frame nets will be set overnight. Because the amount of effort required to obtain statistically significant results may be impractical, the overall sampling design will instead focus upon standardizing effort between equivalent size (surface acres) water bodies. Table 1 categorizes the respective water bodies by size and includes a set description and number of sets for each category. At a minimum, the amount of effort shown in Table 1 must be used when surveys are conducted on a given water body. The number of lakes sampled annually will depend upon district priorities; however, all mid-size reservoirs, Devils Lake and Lakes Oahe and Sakakawea must be surveyed annually.

In addition to standardizing nets and sets, the location and time of sampling should also be standardized. Permanent sampling locations for each net type should be established on each lake, then marked, and described on a suitable lake map. This map should become a permanent part of the lake's file. Under certain conditions such as drought, sampling the exact same station may not be possible, but the same general area or similar area should be sampled. Depending upon the area in the state, the time in which reproduction sampling is

conducted for each respective lake should be standardized between mid August and September 30. Special circumstances such as access, or a historical database may warrant establishing a standard sampling time during some other time period; however, this is strongly discouraged. Sampling before mid-August will underestimate the YOY catch because the small fish are not generally vulnerable to the sampling gear. Similarly, sampling in October will likely underestimate the YOY abundance due to cold water temperatures which slows fish metabolism/movements.

The intent for standardizing locations and time of sampling is to monitor the reproductive success and observe relative changes over time (valid annual comparisons). Permanent sampling stations reduce variance and can yield index type information.

Electrofishing will be used occasionally to supplement the net catch and to sample species normally not captured in gill or frame nets. In addition, electrofishing has proven effective in indexing (e.g. Serns index) walleye year classes. Because these techniques are relatively new in North Dakota a standardized procedure to sampling may be modified in future years. However, for the present time the following procedure will be used.

Choose a location on a lake from which to begin electrofishing at sundown. Electrofish in a predetermined direction for one hour or until the entire shoreline is sampled (whichever is first). Areas of select habitat may be chosen. In the rare event that electrofishing by time proves impractical on a given lake, use distance but be sure to record the time it takes for shocking the distance. This will enable you to convert back to fish per unit of effort. Two people will be on the bow of the boat to collect (dip) game fish.

To keep the effort standard from year to year, stations should be described on the lake map along with specifications for electrofishing settings, and other pertinent data. Sampling will be done at a time of year when the target species is vulnerable and variability in catch is expected to be low. Preferably it can be performed in conjunction with other reproduction netting.

### **Data Collection**

Enter required data in the header of the new CATCH RECORD FIELD DATA FORM. Because the primary intent of reproduction sampling is to determine reproductive and stocking success of YOY fish, only enumeration by species and age is required. However, catches from each net must be kept separate. Age should be classified as YOY, YRL, or ADT. If age determination in the field is uncertain than scales should be collected and read in the lab. Additional data (i.e. lengths) are optional.

When field work is complete, all data sheets should be reviewed immediately for completeness and possible errors. The importance of thoroughly filling out the data sheets cannot be over-emphasized. Data should be entered onto the catch record program (AC1) at the respective district offices as soon as possible and again errors in the data or data entry must be corrected immediately.

### **End-Products**

Results from REPRODUCTION SAMPLING will include detailing YOY species composition, reproductive/stocking success and future population trends. Supplemental age-growth and food habits are optional but can also provide useful data. This information in combination with other sampling efforts will provide the mechanism for making management and research decisions.

Table 1.

## SIZE OF WATER BODIES - DESCRIPTION OF SETS - NUMBER OF NET SETS

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<b>SIZE OF WATER BODY</b>	<b>SET DESCRIPTION</b>	<b># OF SETS</b>	<b>NUMBER OF ACRES SAMPLED/ONE UNIT OF RESPECTIVE NET TYPE EFFORT</b>
1 - 100	2 - 125' 1/2" 2 - 3' X 4', 1/4"	1	25
101 - 500	3 - 125' 1/2" 3 - 3' X 4', 1/4"	1	200
501 - 1,800	Same as above	2	190
1801 - 3,600	Same as above	3	300
3601 - 10,000	Same as above	4	
19,000	Same as above	5	1265
50,000	2 - 125' 1/2" 2 - 3' x 4', 1/4"	12	2083
100,000	3 - 125', 1/2" 3 - 3' x 4', 1/4"	11	3030
350,000	Same as above	30	3890